

REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the careful consideration given the present application. Reconsideration of the subject patent application in view of the present remarks is respectfully requested.

Claims 1-13, 16, and 18 are cancelled.

Claims 22-23 are withdrawn.

Claims 14 and 17 are amended.

New claims 24-27 are added.

Claim Rejections - 35 USC § 102

Claims 14-16 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Murakawa et al [US 2004/0241968; hereinafter "Murakawa"]. Applicants respectfully request withdrawal of the rejection for at least the following reasons.

Claim 16 has been cancelled. Thus, the rejection as it applies to claim 16 should be withdrawn.

Claim 14 has been amended to include the limitation, "the inactive He plasma is radiated while the semiconductor substrate is cooled." Support for the amendment is found on page 18, lines 15-23 of the specification.

Regarding the amended claim 14, Murakawa does not disclose that the inactive He plasma is radiated while the semiconductor substrate is cooled. As stated in the paragraph

[0067] of Murakawa, the radiation of high density plasma of Murakawa is a process carried out for annealing the doped substrate in order to recrystallize the substrate. Therefore, the substrate should not be cooled during the plasma radiation process of Murakawa since the substrate cooling may deprive the substrate of enough energy and prevent the substrate from being recrystallized. Thus, Murakawa does not disclose or imply the limitation that “the inactive He plasma is radiated while the semiconductor substrate is cooled.” Therefore, since every limitation of claim 14 is not taught by the reference, claim 14 is not fully anticipated by Murakawa. Thus, withdrawal of the rejection as it applies to claim 14 is respectfully requested.

Claims 15 and 19-21 which are dependent from claim 14 should also be allowable for at least the same reason.

Claims 14, 16-17 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang [US 6,051,482]. Applicants respectfully request withdrawal of the rejection for at least the following reasons.

Claim 16 has been cancelled. Thus, the rejection as it applies to claim 16 should be withdrawn.

Regarding the amended claim 14, Yang does not disclose the step of radiating inactive He plasma to the surface of the semiconductor substrate after the impurity is introduced in the impurity introducing step. The Office action states that Yang discloses the above feature in claims 14 and 16-17 of Yang. However, Yang merely discloses that helium is mixed with B₂H₆ in the step of forming the P-type layer with boron plasma (which corresponds to the impurity introducing step of the present invention) (Yang; claim 16). This is clear from the Yang's

description that the boron dopants are created by mixing a main gas (for example, gases He, H₂) with a diluent gas (for example, 1%-6% of B₂H₆) (Yang; col. 4, lines 39-55). There is no disclosure in Yang that helium is radiated **after the impurity is introduced in the impurity introducing step**. Therefore, since every limitation of claim 14 is not taught by the reference, claim 14 is not fully anticipated by Yang. Thus, withdrawal of the rejection as it applies to claim 14 is respectfully requested.

Claims 17 and 20 which are dependent from claim 14 should also be allowable for at least the same reason.

In addition, regarding claim 17, Yang does not disclose that a temperature of the surface of the semiconductor substrate is kept below 200 degree Celsius.

Regarding new claim 24, neither Murakawa nor Yang discloses a step of radiating inactive plasma to the surface of the semiconductor substrate after the impurity introducing step such that the impurity concentration at a depth position of 4nm is set to be 1/10 or more of the impurity concentration on the surface of the semiconductor substrate.

Regarding new claim 25, neither Murakawa nor Yang discloses that the impurity concentration at a depth position of 7nm is set to be 1/100 or more of the impurity concentration on the surface of the semiconductor substrate.

Regarding new claim 26, neither Murakawa nor Yang discloses that the inactive He plasma knocks the impurity introduced in the surface. Support for the limitation, "the inactive He plasma knocks the impurity introduced in the surface" is found on page 19, line 19 to page 20, line 13 of the specification.

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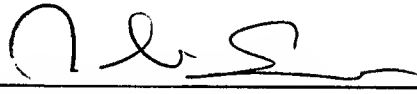
Regarding new claim 27, neither Murakawa nor Yang discloses that the temperature of the surface of the semiconductor substrate is kept below 100 degree Celsius.

In consideration of the foregoing analysis, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. NGB-41341.

Respectfully submitted,

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